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REMARKS

This communication is in response to the Office Action mailed on January 20, 2006. In the Office Action, claims 1-16 were pending. All pending claims were rejected. For the reasons that follow, reconsideration and allowance of all claims are respectfully requested.

On page 2 of the Office Action, claims 1-3, 5, 10 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bruderlin et al. (U.S. Patent Application No. 2003/0179203, hereinafter "Bruderlin") in view of Chang, J.T. et al. ("A practical model for hair mutual interactions", Proc. of 2002 ACM Siggraph/Eurographics Symposium on Computer Animation, ACM Press, New York, NY, pages 73-80, hereinafter "Chang"). On page 5, claims 4 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bruderlin in view of Chang, and further in view of Franco et al. ("Modeling the structure of feathers", In Proceedings of SIGGRAPH 2001-XIV Brazilian Symposium on Computer Graphics and Image Processing, p. 381, Oct. 2001). On page 6 of the Office Action, claims 6-8 and 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bruderlin in view of Chang, and further in view of Lapperrière (U.S. Patent No. 5,912,675). On page 9 of the Office Action, claims 9 and 16 were rejected under 35 U.S.C. § 102(a) as being unpatentable over Bruderlin in view of Chang, and further in view of Greg Turk ("Retiling polygonal surface", Computer Graphics, Proceedings of SIGGRAPH 92, 26(2) pages 55-64, July 1992). Of these claims, claims 1 and 10 are in independent form.

Bruderlin describes a system for digitally representing a plurality of surface-attached geometric objects on a model such as the digital generation, placement, animation, and display of feathers on animal models. The system of Bruderlin comprises generating a plurality of particles and placing the particles on a surface of the model. A plurality of curves are generated and

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placed at locations on the model. A second plurality of curves is interpolated from the first plurality of curves at locations of the plurality of particles. A plurality of surface-attached geometric objects is generated that replaces all of the particles and the second plurality of curves. However, as mentioned in the Office Action with regard to claim 1, Bruderlin fails to teach "automatically detecting collisions between adjacent feathers based on the shape of each feather" and "automatically adjusting the respective growing directions of the feathers such that the respective shape of each feather does not collide with the shape of an adjacent feather."

Applicants further submit that although Bruderlin discusses a curve/surface collision mode, there is no suggestion or motivation to detect collisions automatically nor that a growing direction for feathers are adjusted automatically. For example, paragraph 72 of Bruderlin provides, "the combing tool also provides a simple curve/surface collision mode, in which key-curves that intersect the underlying surface patches are pushed back up." Furthermore, any collision that is detected is between a key-curve and a surface. At best, this collision involves a line and a surface and simply not detecting collisions between shapes of feathers. Without detecting collisions between feathers, a large amount of manual input is necessary to provide a suitable graphic model that renders feathers on a surface.

Further, paragraph 137 describes, "interpenetration between the procedural surface-attached geometric objects and animated object model or hand animated geometric objects may be reduced or substantially limited..." This section also fails to teach or suggest any motivation for automatically detecting collisions between adjacent feathers based on the shape of each feather and automatically adjusting the growing direction of the feathers such that the respective shape of the feathers does not collide with the shape of an adjacent feather. It is further submitted that paragraph 137 refers to animation of feathers

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during flight and simply does not refer to a growing direction on a surface and adjusting the growing direction such that feathers do not collide. Furthermore, paragraph 137 suggests that manual input may be necessary to correct inconsistencies in feather placement. While Bruderlin describe a shape of a feather, there still is no teaching or suggestion of using that shape in collision detection.

With regard to Chang, a model for hair mutual interactions is disclosed. In particular, Chang describes representing hair strands utilizing generalized cylinders as approximations of hair groupings. To model hair-hair collisions, Chang describes that generalized cylinders or triangular strips can be used to represent local hair groupings. If a collision is detected, portions of hair segments in contact are moved away from each other by generating a spring force. Thus, Chang does not teach or suggest adjusting a growing direction at a vertex. Furthermore, Chang does not teach or suggest rotating a feather with respect to a vertex.

For reasons that follow, Applicants respectfully submit that the combination of Bruderlin and Chang does not include objective evidence of record to render independent claims 1 and 10 obvious. The Federal Circuit in In re Lee, 61 USPQ 2d 1430, 1433 (Fed. Cir. 2002), held that a factual inquiry on whether to combine references must be based on objective evidence of record, which has been reinforced in a number of decisions. Further, the Court of Lee stated that "a showing of a suggestion, teaching or motivation to combine the prior art references is an 'essential component of an obviousness holding'."

Based on the holding in In re Lee, Applicants submit that there is no suggestion or motivation to combine the method of digital feather representation of Bruderlin with the method of hair-hair collision detection of Chang. As mentioned above, while Bruderlin describes the placement of feathers on an animal model, it does not teach or suggest automatic collision detection or

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automatically adjusting a growing direction. Instead, substantial manual input is required to create an adequate model of feathers. Chang, on the other hand, is fundamentally different than the method in Bruderlin as Chang is directed to hair strand dynamics. Chang describes representing hair strands utilizing generalized cylinders and triangular segments as approximations of hair groupings and collisions. If a collision is detected, the portions of the hairs segments in contact are moved away from each other, without any teaching or suggestion of adjusting a growing direction.

In particular reference to claim 1, Applicants submit that Chang does not teach or suggest "automatically adjusting the respective growing directions of the feathers such that the respective shape of each feather does not collide with the shape of an adjacent feather" as recited in claim 1. The Office Action cites Chang (page 76, section 4.2 Dynamic Interactions, 3rd and 4th para.) as disclosing the above limitation. Instead, Chang discloses that once a collision is detected, a damped spring force is generated to push the pair of elements away from each other (page 76, para. 3). Meanwhile, a frictional force is also generated to resist tangential motion. However, as best can be seen, these forces are simply used to move the hair elements away from each other at the point at which the collision is detected. There is simply no mention of adjusting growing directions. The growing directions, as recited in claim 1, are established for each of the plurality of vertices on the surface, as feathers are placed on the surface based on the plurality of vertices and the growing direction. Thus, as can be clearly seen, Chang does not teach or suggest "automatically adjusting the respective growing directions" as recited in claim 1. Furthermore, Chang does not teach or suggest rotating feathers with respect to a vertex until no collision is detected. Thus, Applicants have amended claim 1 to recite that adjusting respective growing directions is performed "by rotating the feathers with respect to their

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vertices". This feature is simply not taught or suggested by the combination of Bruderlin and Chang.

For at least these reasons, Applicants respectfully submit that claim 1 is allowable over the cited references. Further, Applicants submit that related dependent claims 2-9 are also in allowable form at least based on their relation to claim 1.

With regard to independent claim 10, a method for placing feathers on a surface is recited including "if the shape of the feather at the vertex collides with a shape of an adjacent feather, then automatically adjusting the growing direction of the vertex until there is no collision between the shape of the feather and said shape of the adjacent feather." As mentioned above, there exists a lack of suggestion or motivation to combine Bruderlin and Chang. Further, even if combined, Bruderlin and Chang would not achieve determining collision of feathers based on the shape of the feathers and automatically adjusting the growing direction of the vertex until there is no collision. In addition, claim 10 has been amended to recite adjusting the growing direction is performed "by rotating the feather with respect to the vertex". For at least these reasons, Applicants respectfully submit that claim 10 is in allowable form. Further, Applicants respectfully submit that related dependent claims 11-16 are also in allowable form at least based on the relation to claim 10.

In view of the foregoing, Applicants respectfully request withdrawal of the rejection to claims 1-16. Favorable action is solicited.

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The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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